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SOME AMERICAN SPIDERS OF THE FAMILY HAHNIIDAE

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The spiders of the family Hahniidae, formerly regarded as constituting a subfamily of the Agelenidae, are sharply distinguished from all others by the singular arrangement of the spinnerets. The conventional three pairs are present, but they are placed in a transverse row, their bases being in nearly a straight line. The one-jointed middle pair is invariably shorter than the others, which are two-jointed. The outer or lateral pair, corresponding to the posterior spinnerets of other spiders, is usually longer than the second or anterior pair, the discrepancy being due mainly to the longer apical joint. The proportions of the spinnerets are of primary taxonomic value.

The well-developed tracheal system communicates with the outside by a single tracheal opening that is situated far in advance of the spinnerets. The spiracle is particularly large and conspicuous in *Neoantistea*. While its value as a family character has been fully recognized, the relative position of the spiracle on the abdomen has been neglected and seems to merit more attention in the definition of genera than has been accorded it. A comparison of thirteen species in this particular indicates that the four genera represented could easily be separated by this character alone. In the following ratios the measured distance of the spiracle from the genital furrow is taken as 1.00, and the distance of the spiracle from the base of the median spinnerets evaluated in terms of that number.

	MALE	FEMALE
Bigois tatei Gertsch (Venezuela)	1:0.21	1:0.21
Hahnia pusilla C. Koch (Europe)	1:0.50	1:0.50
Hahnia cinerea Emerton	1:0.67	1:0.55
Hahnia ernesti Simon (West Indies)		1:0.33
Hahnia okefinokensis Chamberlin and Ivie	1:0.44	1:0.44
Hahnia mengei Chyzer and Kulczynski (Europe)	1:0.50	1:0.50
Hahnia flaviceps Emerton	1:0.68	1:0.98
Antistea elegans Blackwall (Europe)	1:1.00	1:1.29
Antistea brunnea Emerton	1:1.40	1:1.10
Neoantistea agilis Keyserling	1:2.33	1:2.00
Neoantistea gosiuta Gertsch	1:2.00	1:2.16
Neoantistea riparia Keyserling	1:2.68	1:1.85
Neoantistea riparia race *radula* Emerton	1:2.60	1:2.00
Neoantistea barrowsi Gertsch	1:2.42	1:3.00

Although all the Nearctic species were originally described in *Hahnia*, a survey shows that three genera are represented. A new generic name, *Neoantistea*, is proposed for a group of four species, including *Hahnia riparia* Keyserling, which was placed in *Antistea* by Simon. One American form, *H. brunnea* Emerton, conforms to *Antistea*. The representatives of these two genera are much stouter and considerably larger than most other hahniids. In addition, they have the eyes conspicuously larger, the anterior medians being quite as large or larger than the laterals. In *Hahnia* and related genera the anterior median eyes are greatly reduced in size, and in *Iberina*, a European cave form, none of the eyes are present. Only three species of *Hahnia* are known from the United States. *Hahnia okefinokensis* Chamberlin and Ivie is included in this paper through the courtesy of the authors, to whom I am further indebted for other valuable material. Eight species and two varieties represent the total number of forms at present known from the United States. A new species of *Bigois* is included for comparison.

KEY TO THE GENERA

1.—Anterior median eyes about as large or larger than the anterior laterals.....2.
Anterior median eyes considerably smaller than the anterior laterals.....3.

2.—Spiracle midway between the genital opening and the base of the median spinnerets; distal joint of the lateral spinnerets shorter than the basal; male palpus with a femoral apophysis.....ANTISTEA Simon.
Spiracle twice as far from the base of the median spinnerets as the genital furrow; joints of lateral spinneret subequal; male palpus lacking femoral apophysis.....NEOANTISTEA, new genus.

3.—Anterior median eyes minute; spiracle five times as far from the genital opening as the base of the median spinnerets; labium as long as broad.
BIGOIS Simon.
Anterior median eyes comparatively larger; spiracle only twice as far from the genital opening as from the base of the median spinnerets; labium broader than long.....HAHNIA C. Koch.

HAHNIA C. Koch

C. KOCH, 1841, 'Die Arachniden,' VIII, p. 61.

GENOTYPE.—*Hahnia pusilla* C. Koch.

Carapace convex, longer than broad. The eyes small, the anterior row procurved, subcontiguous, or slightly separated, the medians equal or smaller than the laterals. Posterior row of eyes slightly procurved, the medians smaller, farther apart. Median ocular quadrangle broader than long, narrowed in front, the posterior eyes larger. Lower margin of furrow of chelicerae with two, three, or four subequal denticles. Sternum longer than broad, rarely as broad as long (*mengei*). Labium broader or as broad as long. Spiracle twice as far from the genital furrow as the base of the median

spinnerets, or midway (*flaviceps*). Distal joint of the lateral spinnerets usually shorter, sometimes nearly equal in length, than the basal.

Of the four species of *Hahnia* considered in this paper, three are Nearctic. At least thirteen are known from the Palearctic regions. The dearth of known American species is probably to be ascribed to the lack of large representative collections from all over the country. *Hahnia cinerea* Emerton is very common, widely distributed, and agrees very well with the genotype, *H. pusilla*, the palpus of that species differing chiefly in lacking the feathery apophysis on the bulb. The most divergent of the American species is *Hahnia flaviceps* Emerton, which, by virtue of the broad pars cephalica, heavier legs, submedian position of the tracheal spiracle, and the highly modified palpus, may deserve generic separation from the genus *Hahnia*.

KEY TO THE SPECIES OF *Hahnia*

1.—Posterior eye row half as broad as the pars cephalica at that point; carapace and legs unmarked; tibial apophysis long, not strongly curved. *H. flaviceps* Emerton.

Posterior eye row two-thirds as wide or more than the pars cephalica at that point; carapace with at least marginal maculations; legs annulate or not . . 2.

2.—Males . . . 3.

Females . . . 5.

3.—Tibial apophysis very short, straight. *H. okefinokensis* Chamberlin and Ivie, new species.

Tibial apophysis strongly curved . . . 4.

4.—Legs sometimes darkened, but not annulate . . . *H. cinerea* Emerton.

Legs distinctly annulate in black . . . *H. cinerea seminola*, new race.

5.—Carapace pale, with marginal black maculations on the pars thoracica and a median black spot . . . 6.

Carapace dark, strongly marked with black radial striae; the head portion streaked . . . 7.

6.—Sternum slightly longer than broad . . . *H. ernesti* Simon.

Sternum broader than long . . *H. okefinokensis* Chamberlin and Ivie, new species.

7.—Legs light, annulate . . . *H. cinerea seminola*, new race.

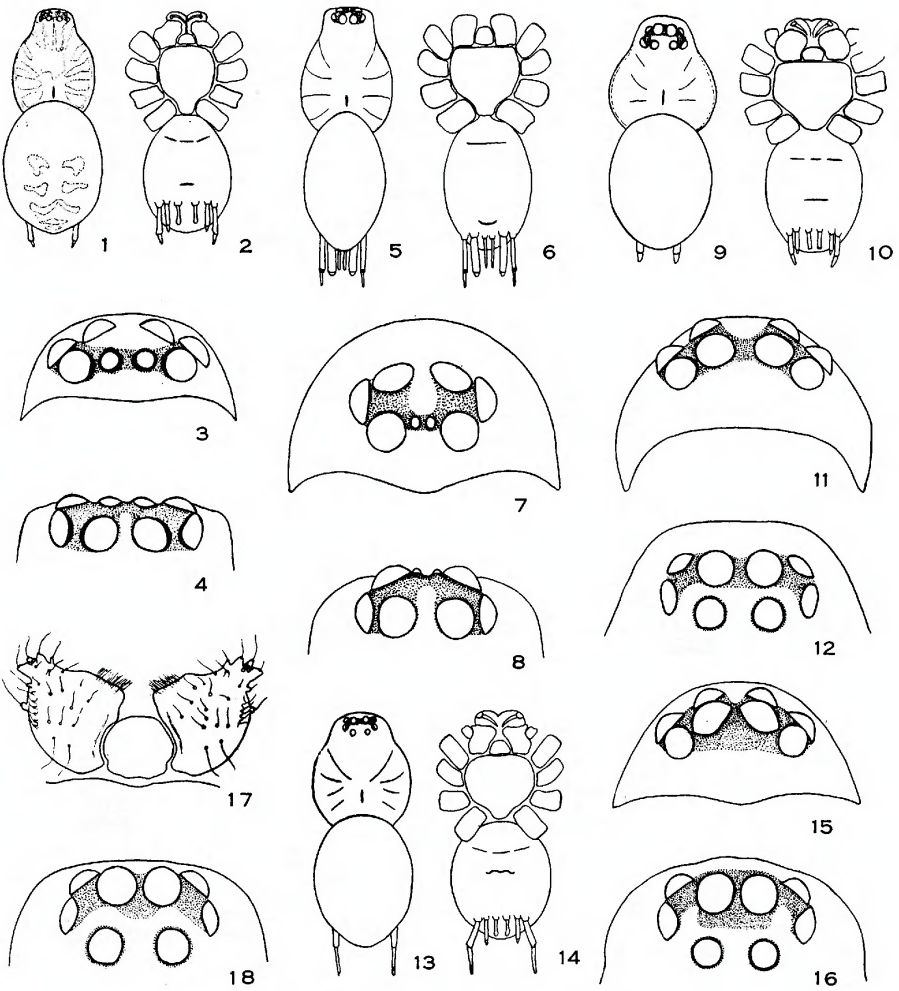
Legs dark, not annulate . . . *H. cinerea* Emerton.

Hahnia cinerea Emerton

Figures 1, 2, 3, 4, 19, 20 and 21

Hahnia cinerea EMERTON, 1889, Trans. Connecticut Acad. Arts and Sci., VIII, p. 33, Pl. VII, figs. 9–9*b*.; 1894, p. 412; 1902, p. 1061, Fig. 252; 1913, p. 257. MARX, 1890, p. 517. BANKS, 1892, p. 27; 1902, p. 214; 1910, p. 15; 1932, p. 21. BRYANT, 1908, p. 79. PETRUNKEVITCH, 1911, p. 534. BISHOP AND CROSBY, 1926, pp. 203–204. CROSBY AND BISHOP, 1928, p. 1065. CHAMBERLIN AND IVIE, 1933, p. 49.

Hahnia species BANKS, 1895, p. 423; 1902, p. 214.



BODY OUTLINES AND EYE RELATIONS

Figs. 1, 2, 3, and 4. *Hahnia cinerea* Emerton.
Figs. 5, 6, 7, and 8. *Bigois tatei*, new species.
Figs. 9, 10, 11, and 12. *Antistea elegans* Blackwall.
Figs. 13, 14, 15, 16, and 17. *Neoantistea riparia* Keyserling.
Fig. 18. *Neoantistea riparia radula* Emerton.

Several males from Florida and Utah average 1.65 mm. in total length, the smallest, 1.45 mm. The females average slightly larger, 1.75 mm., though some are as small as the smallest males.

The integument of the carapace varies from light to dark brown, upon which is superimposed a characteristic pattern in black. In well-marked specimens the radial striae of the pars thoracica are broad bands, the caudal ones coalesced. In the middle of the carapace is an irregular, quadrangular maculation, from which extend two bands of black, one passing laterad to the posterior lateral eyes, the other, usually broken, going to the posterior median eyes. The carapace is margined by a black band that terminates after joining the band delimiting the side of the cephalic portion. The eye region is dark, and the clypeus is black or dusky.

The appendages of specimens from New England, Ohio, and Utah agree well with Emerton's color description: "The legs are light yellowish brown with patellae, coxae, and the ends of the longer joints paler than the others." The material from Florida, however, represents a striking color variety in which the legs are conspicuously annulate, the femora with basal and distal, the other joints with a sub-basal ring. In this color-form the sternum is usually darkened and marked by light maculations on the margins. In typical examples the sternum is dusky or black, the margins darker. The labium, endites, and coxae are usually, though not always, lighter than the sternum.

The abdomen in the typical form varies from gray to black and is marked by a double row of oblique or simple transverse bands of light color and numerous small light spots. A male from Ohio has the bands reduced to rows of small light spots. Specimens from Florida have the light bands greatly enlarged, especially caudally, the venter and sides with a speckled appearance. The spinnerets are usually light.

A male from Utah, 1.85 mm., was used as a basis for the following measurements.

	Carapace	Front	Sternum	Labium	Endite	Abdomen
Length	.85	.17	.52	.10	.20	1.05 mm.
Width	.66	.32	.47	.15	.22	.85 mm.

The cephalothorax is smooth and shining throughout, provided with a few small hairs on the clypeal margin. The decidedly longer than broad carapace is truncate behind, weakly rounded at the sides to the well-defined cephalic constriction, which is well behind the last eye row, the pars cephalica squared off in front. The cephalic portion is half as wide as the greatest width, is about the same height throughout, and gradually fades into the thoracic portion, which is nearly as high. The median suture is weakly indicated at a point two-thirds of the length back. The clypeus is two-thirds as high as the diameter of an anterior lateral eye.

The first eye row is narrower than the second in the ratio 32: 38, procurved, a line through the center of the lateral eyes touching the lower margin of the medians, which are much smaller and a little farther apart than their distance to the laterals. The second row is slightly procurved, the medians farther apart than their distance from the laterals (5.5/4), as far from the anterior medians. Ratio of the eyes: ALE: AME: PLE: PME = 8: 5: 9: 8. The median ocular quadrangle is broader than long (20/18), narrower in front (20/13), the anteriors much smaller.

The parallel chelicerae are about twice as long as broad, little narrowed distally, and are armed above with two teeth, the lower margin with four small subequal teeth. The labium is two-thirds as long as broad, half as high as the endites. The longer than

broad sternum is truncate in front, widest between the first and second coxae, weakly rounded on the sides, and truncated between the last coxae, separating them by their width. A sparse covering of inconspicuous black hairs covers the ventral parts of the cephalothorax.

Leg formula, 4123. The first pair of legs are slightly stouter than the others, the femora a little incrassate at the base above.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	.57	.25	.42	.42	.32	1.98 mm.
II	.52	.25	.40	.40	.32	1.89 mm.
III	.50	.22	.35	.40	.30	1.77 mm.
IV	.62	.25	.50	.52	.37	2.26 mm.
Palp	.25	.12	.10		.27	.74 mm.

Ratio of coxae I: II: III: IV = 100: 100: 85: 95.

Width of patella I, .10 mm. Tibial index, 14.

Width of patella IV, .082 mm. Tibial index, 11.

The legs are clothed with rows of black hairs, the only spines worthy of mention being one at the distal end of the patellae above, usually present on all the legs, and an occasional lateral or ventral spine on the tibiae.

The abdomen in the male is a little longer than broad and projects over the caudal margin of the carapace. The spiracle is located at a point much nearer the spinnerets than the genital furrow, the measurements being .67 mm. and 1.00 mm. The short median spinnerets (.15 mm.) are separated at base by their diameter from the two-jointed second spinnerets (basal joint .20 mm., the distal minute) which are subcontiguous with the lateral spinnerets (basal joint .25 mm., distal joint .15 mm.). The lateral spinnerets are placed a little higher on the abdomen than the others, the distal joint about half as long as the basal.

Male Palpus.—The femur is about equal in length to the patella and tibia taken together, which are scarcely as long as the tarsus. Near the middle of the patella on the outer side is a light-colored, curved spine. The tibial joint is provided on the retrolateral face with a strongly curved, slender apophysis that is distally roughened. The cymbium is longer than broad, hollowed to receive the comparatively simple bulbal parts. The embolus begins at the base on the outer side, encircles the bulb, and ends at the distal outer margin, where an inconspicuous conductor emerges from the bulb. An interesting feathery appendage is present near the base of the bulb on the prolateral side, which is characteristic of other species of *Hahnia*, as well as *cinerea*, notably *Hahnia mengei* of Europe.

A female from New Jersey measures 1.35 mm. and is used as a basis for the following measurements.

	Carapace	Front	Sternum	Labium	Endite	Abdomen
Length	.70	.16	.45	.10	.17	.68 mm.
Width	.52	.32	.39	.15	.17	.50 mm.

The sternum is longer than broad as in the male. The upper cheliceral margin is armed with two or three teeth, the lower with four small subequal denticles. Ratio of the eyes: ALE: AME: PLE: PME = 7: 5: 8.5: 7. The relations of the eyes agree well with the male, the quadrangle being broader than long (20/16), narrower in

front (14/20), the posterior medians separated from each other by less than a diameter, nearer the posterior laterals (3.5/5).

Leg formula, 4123.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	.54	.22	.38	.35	.27	1.76 mm.
II	.50	.22	.35	.35	.27	1.69 mm.
III	.47	.20	.32	.32	.25	1.56 mm.
IV	.60	.25	.50	.48	.32	2.15 mm.
Palp	.25	.11	.17		.37	.90 mm.

The abdomen is usually proportionately larger than in the male, the spiracle being placed much nearer the spinnerets than the genital furrow (4/7). The distal joint of the lateral spinnerets is .10 mm. long, scarcely half as long as the basal joint (.175 mm.). The second pair has the distal joint minute, the basal longer than the single joint of the middle spinnerets (.175 mm./.137 mm.).

Epigynum.—The details of the female reproductive organs are usually obscured by color markings. The atriobursal orifices are rather small and separated by twice or more their diameter. In *Hahnia mengei*, which the species closely resembles, the epigynum is very similar, the principle difference being in the greater separation of the atriobursal orifices.

Distribution.—Maine: Long Island, August 27, 1906 (Bryant). New Hampshire: Lake Winnepesaukee (Bryant, 1908); North Woodstock, September, 1911; Fitzwilliam, May 24–30, 1907 (Bryant); Randolph, July 1, 1926 (Emerton). Massachusetts: Swampscott, February 1 (type locality of *cinerea*, Emerton, 1889); Salem, Beverly, Cambridge, Roxbury, Mt. Tom (Emerton, 1889); Brookline, Clarendon Hills (Bryant, 1908); Newton, April 6, 1904 (Bryant); Holliston, March 25, 1924 (Bryant); Carlisle Pines, October 26, 1907 (Bryant). Connecticut: New Haven (Emerton, 1889). New York: upper Cayuga Lake basin—Fall Creek, Buttermilk Creek (Banks, 1892); Wilmington Notch, August, Wilmington, August, Newcomb, July, Olcott, September, Ithaca, April, Freeville, August, Labrador Pond, June, Karner, March, Juanita Island, June, Little Pond, Orange County, May, Sam's Point, May, Riverhead, Long Island, April (Crosby and Bishop, 1928); Onondaga County, October 17, 1900 (Britcher). New Jersey: Farmingdale, May 3, 1912 (Emerton, 1913); Lakehurst, May 1, 1912 (Emerton). Virginia: Falls Church; Alexandria (Chamberlin). North Carolina: Walnut Creek, Raleigh, October 26, 1923 (Bishop and Crosby, 1926). Ohio: Columbus, June 12, 1916 (Barrows); Sugar Grove, July, 1915 (Barrows, 1918); Salineville; Hamden, May 1, 1926 (Barrows). Oklahoma: Cleveland County, March 31, 1930 (Banks, 1932). Colorado: Fort Collins (Banks, 1895). Utah: Clear Creek: south fork of Raft River; Dove Creek (Chamberlin and Ivie, 1933); Butterfield Canyon,

June 16, 1930 (Gertsch); Mill Creek; Logan Canyon (Chamberlin). Arizona: Williams, June 5 (Banks, 1902). Canada: Ontario—Ottawa (Emerton, 1894); Lake Megantic, July, 1916. Alaska: Ketchikan, August 29, 1922 (Marshall).

Hahnia cinerea race **seminola,** new race

In addition to the differences in color cited above, this interesting variety has the eyes proportionately larger. The posterior median eyes are nearer together than in typical *cinerea.*

DISTRIBUTION.—Male holotype, female allotype, and male and female paratypes from Gainesville, Florida, February 27, 1927, the types deposited in the collection of The American Museum of Natural History through the courtesy of the collector, Dr. W. M. Barrows of Ohio State University.

Hahnia okefinokensis Chamberlin and Ivie, new species

Figures 22 and 23

The male holotype measures 1.30 mm. in total length; the female allotype, 1.45 mm.; and a female paratype, 1.32 mm.

In the male the carapace is light yellow and, with the exception of the dark field enclosed by the eyes, has no distinguishing markings. The female has the carapace margined in black and has a dorsal black maculation at the median suture and four black markings at the position of the thoracic striae. The sternum is immaculate in the male but margined in black in the female. The legs, concolorous with the integument of the carapace, are annulate in the female, unmarked in the male. The abdomen is dirty white to gray, the sides dark, the dorsum with transverse chevrons in the female that are nearly obliterated in the male. The basal joint of the lateral spinnerets is broadly banded in black.

The following measurements are for the male.

	CARAPACE	FRONT	STERNUM	LABIUM	ENDITE	ABDOMEN
Length	.60	.13	.37	.06	.16	.77 mm.
Width	.50	.30	.40	.10	.15	.57 mm.

The cephalothorax of the male is smooth and shining throughout and provided on the midline of the dorsum and in the eye area with several long black spines. The carapace is five-sixth as broad as long, the pars thoracica nearly round, delimited from the broad cephalic portion by a weak constriction. The moderately high pars cephalica grades gradually and almost imperceptibly into the thoracic portion. The sternum, about as broad as long, is clothed with regularly spaced, long black hairs. The labium is broader than long, three-eighths as long as the endites. The gently sloping clypeus is scarcely as high as the diameter of an anterior lateral eye. The chelicerae are armed below with two small subcontiguous teeth, the upper margin with three teeth.

The first row of eyes is narrower than the second in the ratio 30: 36, procurved, the eyes as seen from above contiguous. The second row of eyes is less procurved, the medians farther apart than their distance from the laterals (7/3). Ratio of the

eyes: ALE: AME: PLE: PME = 9: 4: 10: 10. The median ocular quadrangle is broader than long (24/16), much narrower in front (24/12), the anterior median eyes much smaller.

The abdomen is oval, a little longer than broad. The spiracle is located much nearer the spinnerets (20/45) than the genital furrow. The spinnerets are placed as in other species of *Hahnia*, the distal joints of the lateral spinnerets shorter than the basal (3.5/5).

MALE PALPUS.—The femur is about equal to the patella and tibia taken together and is much longer than the tarsus (10/6). On the retrolateral basal face of the patella is a short retrorse spine, which is equal in length to the forwardly directed spur at the distal end of the tibial joint. The tarsus is little expanded, scarcely broader than the length of the tibia. The oval bulbal apparatus is two-thirds as long as the tarsus, and from its base on the prolateral sides originates the embolus, a slender tube that curves just around the distal end of the bulb.

The following measurements are for the female allotype.

	CARAPACE	FRONT	STERNUM	LABIUM	ENDITE	ABDOMEN
Length	.55	.12	.32	.07	.12	.92 mm.
Width	.47	.30	.40	.10	.12	.80 mm.

The female agrees well with the male in color and in most structural features. The sternum is proportionately much broader than in the male. The endites are decidedly shorter as judged in comparison with the labium. The chelicerae are armed above and below as in the male, but the two teeth on the lower margin are not contiguous. The ratio of the eyes is equivalent, and the relations are the same. The spiracle is located much nearer the spinnerets than the genital furrow (7/16). The distal joint of the lateral spinneret is shorter than the basal. The atriobursal orifices of the epigynum are well separated as in *Hahnia cinerea* and *ernesti*, but other details of that organ are difficult to see.

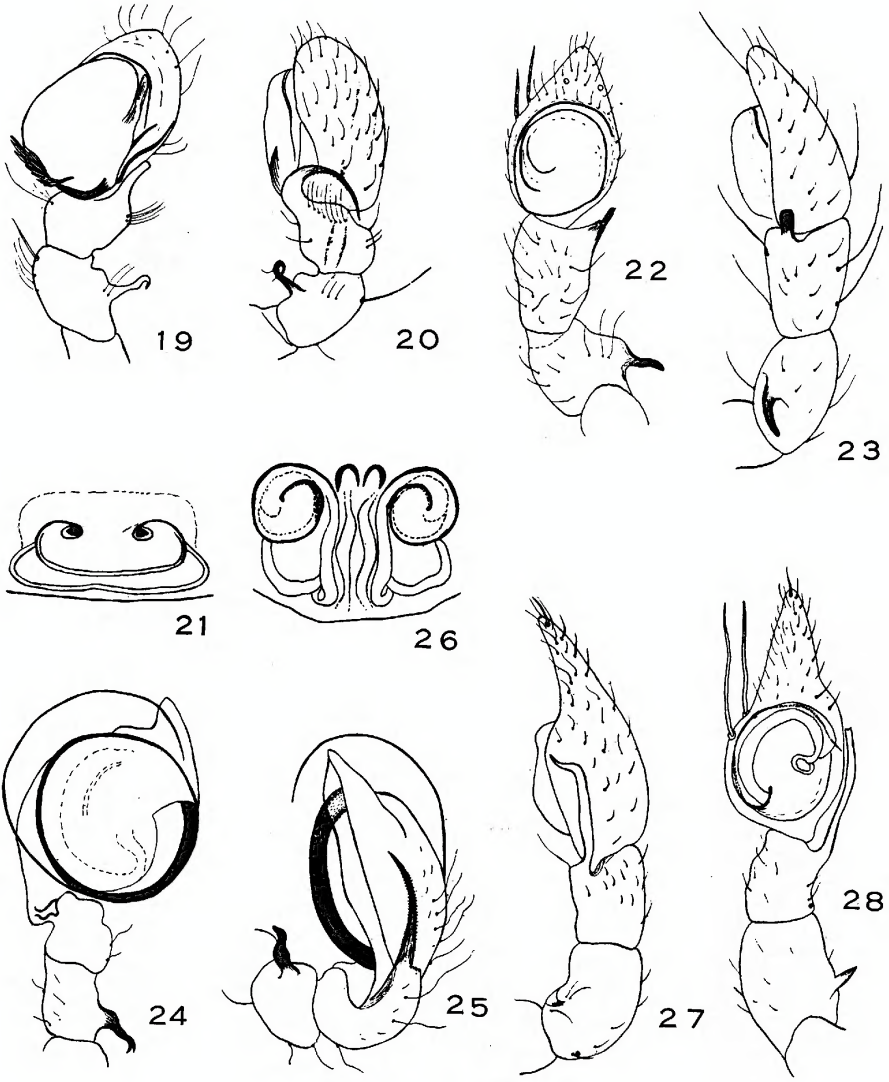
DISTRIBUTION.—Male holotype, female allotype and paratype from the east side of Okefinokee Swamp, Georgia, August 23, 1933, "from under bark scales of a large pine," collected by Mr. Wilton Ivie. The types are in the collection of the University of Utah; the female paratype in the collection of The American Museum of Natural History.

Hahnia ernesti Simon

Hahnia ernesti SIMON, 1897, Proc. Zool. Soc. London, p. 888. PETRUNKEVITCH, 1929, Trans. Connecticut Acad. Arts and Sci., XXX, pp. 78–79, Figs. 67 and 68.

Total lengths of two females, 1.70 mm. and 1.75 mm.

The male was described by Simon in 1897, but it is not represented in our collection. In the 'Spiders of Porto Rico' Petrunkevitch has given a good description of the female. His figure shows the prominent dark markings at the margins of the yellow carapace and the central maculation just anterior to the median cephalic suture. The eyes enclose a black field. The sternum and mouth parts are yellow as is the integument of the distinctly annulate legs. This species agrees well with *Hahnia okefinokensis* in coloration but differs in some structural details. The first female mentioned above is taken as the basis for the following structural diagnosis.



PALPI AND EPIGYNA

Figs. 19, 20, and 21. *Hahnia cinerea* Emerton.
Figs. 22 and 23. *Hahnia okefinokensis* Chamberlin and Ivie, new species.
Figs. 24, 25, and 26. *Hahnia flaviceps* Emerton.
Figs. 27 and 28. *Bigois tatei*, new species.

	Carapace	Front	Sternum	Labium	Endite	Abdomen
Length	.65	.15	.40	.10	.20	1.03 mm.
Width	.54	.30	.35	.13	.13	.83 mm.

The longer than broad carapace has lost the customary covering of hairs. The head portion is clearly demarked from the pars thoracica and is somewhat higher and more convex than in *Hahnia okefinokensis*. The sternum is clearly longer than broad. The lower margin of the furrow of the chelicera is armed with two teeth.

The first row of eyes is narrower than the second in the ratio 30: 38, procurved, but appearing straight from above, the eyes subcontiguous. The second row of eyes is procurved, the medians farther apart than their distance to the laterals (7/3). Ratio of the eyes: ALE: AME: PLE: PME = 9: 6: 10: 10. The median ocular quadrangle is broader than long (23/19), much narrower in front (29/12). The clypeus is about two-thirds as high as the diameter of an anterior median eye. Leg formula, 4123.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	.50	.20	.42	.32	.27	1.71 mm.
II	.50	.20	.35	.30	.27	1.62 mm.
III	.40	.17	.32	.27	.25	1.41 mm.
IV	.55	.22	.47	.42	.31	1.97 mm.
Palp	.17	.10	.15		.20	.62 mm.

Ratio of coxae I: II: III: IV = 8: 7: 6: 7.

Width of patella I, .75 mm. Tibial index, 12.

Width of patella IV, .62 mm. Tibial index, 9.

The spiracle is located much nearer the spinnerets than the genital furrow (.15 mm./.45 mm.). The median spinnerets are short (.12 mm.) and diverge slightly from each other. The basal joint of the second pair is .17 mm. long, slightly shorter than the basal joint of the lateral spinnerets (.20 mm.), the distal joint of which is .17 mm. long, slightly shorter than the basal. The epigynum of the female is indistinguishable from that of *Hahnia okefinokensis*, the atriobursal orifices being well separated as in that species.

Distribution.—St. Vincent, West Indies (Simon, 1897). Puerto Rico: Naguabo, March 7, 1914; Adjuntas, June 8–13, 1915 (Petrunkevitch, 1929).

Hahnia flaviceps Emerton

Figures 24, 25 and 26

Hahnia flaviceps Emerton, 1913, Bull. Amer. Mus. Nat. Hist., XXXII, p. 257, Pl. xlviii, figs. 6–6*d*. Bishop and Crosby, 1926, p. 203.

The total length of the male type is 1.68 mm., the female type, 2.00 mm.

Both sexes are alike in color. The eyes enclose a black field, but the rest of the carapace and the legs are unmarked, light yellowish-brown. The dorsum of the abdomen is provided with gray chevrons, the venter lighter. The light yellow spinnerets are not annulate. The following measurements are for the male.

	Carapace	Front	Sternum	Labium	Endite	Abdomen
Length	.72	.17	.50	.10	.20	1.05 mm.
Width	.65	.30	.45	.15	.17	.75 mm.

The cephalothorax has been rubbed but was apparently provided with spines in the eye area and on the midline of the carapace. The longer than broad carapace is convex and shows little differentiation between the thoracic and cephalic parts. It is about equal in height from the eyes to the median suture, which begins two-thirds of the distance back. The slightly longer than broad sternum is sparsely clothed with black hairs. The clypeus is sloping, considerably more so than in most other species of *Hahnia*, and is equal in the male to twice the diameter of an anterior lateral eye. The lower margin of the furrow of the chelicera is armed with three subequal teeth, the upper with four unequal denticles.

The first row of eyes is narrower than the second in the ratio 29: 38, procurved, but appearing straight from above, the eyes subcontiguous. The second row of eyes is procurved, the medians farther apart than their distance from the laterals (7/3). Ratio of the eyes: ALE: AME: PLE: PME = 9: 6: 9: 8. The median ocular quadrangle is broader than long (24/16), narrower in front (12/24), the anterior medians smaller.

Leg formula, 4123. The legs are much stouter than in most species of *Hahnia* as indicated by the Tibial Indices and are provided with a few spines and a sparse clothing of hairs.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	.62	.25	.37	.30	.22	1.76 mm.
II	.57	.25	.36	.30	.22	1.70 mm.
III	.45	.22	.30	.35	.22	1.54 mm.
IV	.57	.25	.45	.42	.30	1.99 mm.
Palp	.22	.17	.25		.35	.99 mm.

Ratio of coxae I: II: III: IV = 11: 11: 9: 10.

Width of patella I, .112 mm. Tibial index, 18.

Width of patella IV, .087 mm. Tibial index, 12.

The spiracle is located at a point nearer the spinnerets than the genital furrow (.22 mm./.32 mm.). The lateral spinnerets have the basal joint (.20 mm.) longer than the distal (.12 mm.). The basal joint of the second pair is .16 mm. long, that of the medians equal in length to the distal joint of the lateral pair.

Male Palpus.—The femur is scarcely as long as the tibial joint. A retrorse spur is present on the retrolateral side of the patella near the base that is weakly notched at the tip. The tibia is highly modified, overlapping the cymbium to some extent, and is provided with a conspicuous black, toothed spur on the retrolateral side that is two-thirds as long as the cymbium (nearly as long as the cymbium in the male from Columbus, Ohio). Distally the cymbium is modified for the reception of the tube. The bulbal elements are comparatively simple, the embolic tube beginning near the medial prolateral margin, supported to the base of the bulb by a transparent conductor, and then completely encircling the periphery of the bulb to come to rest on the distal cymbial fold.

The following measurements are for the female type.

	Carapace	Front	Sternum	Labium	Endite	Abdomen
Length	.80	.15	.47	.09	.20	1.25 mm.
Width	.52	.37	.42	.17	.17	.82 mm.

In the female the carapace is decidedly longer than broad, and the cephalic portion is more clearly differentiated from the pars thoracica than in the male. The eyes have the same relationship as in the other sex and are proportionately equal in size. The clypeus is only as high as the diameter of an anterior lateral eye. The leg formula is 4123.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	.50	.25	.31	.27	.22	1.55 mm.
II	.45	.25	.31	.27	.22	1.49 mm.
III	.40	.22	.25	.25	.21	1.33 mm.
IV	.50	.25	.40	.37	.30	1.82 mm.
Palp	.21	.10	.12		.20	.63 mm.

Width of patella I, .10 mm. Tibial index, 18.

Width of patella IV, .075 mm. Tibial index, 11.

The spiracle is located at the middle of the abdomen, exactly between the genital furrow and the base of the median spinnerets. The distal joint of the lateral spinnerets is shorter than the basal (.12 mm./.20 mm.).

Epigynum.—Emerton's figure of the epigynum of this species is reversed on the plate. The organ is well developed, and the details are easily visible through the outer sclerotic covering. The atriobursal orifices are close together at the middle of the greatly expanded bursa copulatrix. The complicated arrangements of the intermediate tubules is best shown by a figure.

Distribution.—New Jersey. "Under leaves in a swamp near the railroad station at Farmington," May 3, 1912 (type locality of *flaviceps*, Emerton, 1913). Ohio. Columbus, spring, 1932, one male (Barrows).

Bigois Simon

Simon, 1898, 'Histoire Naturelle des Araignees,' II, p. 277.

Genotype.—*Bigois myops* Simon.

Carapace convex, longer than broad. Eyes large, the anterior row procurved, subcontiguous, the medians minute. Posterior row of eyes slightly procurved, equal in size, the medians farther apart. Median ocular quadrangle broader than long, narrower in front. Chelicerae armed with three subequal teeth on the lower margin. Sternum slightly longer than broad. Labium as long as broad. Spiracle five times as far from the genital furrow as the base of the median spinnerets. The distal joint of the lateral spinnerets very short, the spinnerets proportionately longer than in *Hahnia*.

The generic name *Bigois* is used for the species described below on the strength of the description of a species by Simon from Terra del Fuego, *B. antarctica*. The genotype is from the Philippine Islands. *Neohahnia* Mello-Leitao seems to be closely allied to *Bigois*.

Bigois tatei, new species

Figures 5, 6, 7, 8, 27, and 28

The male holotype is 2.42 mm. in total length, the female allotype, 2.32 mm.

The carapace and legs are light yellowish-brown in both sexes, without contrasting markings of any sort, with the exception of the black field enclosed by the eyes.

The abdomen is gray throughout, immaculate, the distal end of the basal joint of the lateral spinnerets dusky. The following measurements and the structural description are for the male.

	Carapace	Front	Sternum	Labium	Endite	Abdomen
Length	1.17	.25	.67	.17	.32	1.25 mm.
Width	.85	.50	.65	.17	.25	1.12 mm.

The spines of the cephalothorax have been broken off, for the most part, leaving no trace of their normal number or position. The decidedly longer than broad carapace is highest just behind the eyes and remains on nearly the same plane caudad to the median suture, which is placed far back. The convex thoracic portion is nearly round and grades gradually into the broad, rather long pars cephalica, which is truncate in front. The sternum is as broad as long, is truncated in front, evenly rounded on the sides, ending in a blunt point between the last coxae, which are separated by their width. The labium, which is equal in height to its breadth, is about half as long as the longer than broad endites. The mouth parts and sternum are clothed sparsely with black hairs. All the legs of the male have been broken off. The chelicerae are provided near the claw on the outer side with several feathery hairs. The lower cheliceral margin is armed with three small teeth, the upper with three larger ones.

The first row of eyes is narrower than the second in the ratio 24: 31, appearing straight from above, but decidedly procurved as viewed from in front, the eyes about equally spaced, almost contiguous. The second row of eyes is procurved, the eyes subequal, the medians about one-half a diameter apart, almost touching the laterals. Ratio of the eyes: ALE: AME: PLE: PME = 17: 4: 17: 17. The median ocular quadrangle is much broader than long (41/30), narrower in front (41/12), the anterior medians minute.

The longer than broad abdomen is well rounded at both ends. The spiracle is situated very much nearer the spinnerets than the genital furrow (.15 mm./.70 mm.). The basal joints of the spinnerets are proportionately much longer than in *Hahnia*. The basal joint of the lateral pair (.30 mm. long) is slender, much less robust than that of the second, which is quite as long, the median spinneret being somewhat shorter (.22 mm.). The distal joint of the lateral pair (.12 mm.) is less than half as long as the basal joint.

Male Palpus.—The femur is about two-thirds as long as the rest of the appendage. A short laterally directed spur is present at the base on the prolateral face of the expanded patella. The tibial joint has a long bladelike apophysis on the outer side that is curved at the end. The tarsus is longer than broad, not highly modified, the bulbal elements rather simple. The embolus is a slender tube that lies in a fold at the distal end of the bulb.

The female agrees well with the male in all important structural details. As all the specimens are badly mutilated, a more detailed diagnosis is dispensed with.

Distribution.—Male holotype, female allotype, and a male and female paratype from Mt. Duida, Venezuela (Tate, collector).

ANTISTEA Simon

SIMON, 1898, 'Histoire Naturelle des Araignees,' II, p. 275.

GENOTYPE.—*Antistea elegans* (Blackwall).

Carapace convex, nearly as broad as long. Eyes large, the first row procurved as viewed from in front, the eyes equidistantly spaced, the medians as large as or larger than the laterals. Posterior row of eyes slightly procurved, the medians farther apart, equal (*brunnea*) or smaller (*elegans*) than the laterals. Median ocular quadrangle as broad as long, the eyes subequal or the posterior medians smaller. Chelicerae armed with three subequal teeth on the lower margin. Sternum and labium broader than long. Tracheal spiracle situated about midway between the genital opening and the base of the median spinnerets. Spinnerets short, the distal joint of the lateral pair shorter than the basal.

Only one of the American species conforms fully to the definition of *Antistea* as given by Simon. The remarkable similarity between *A. brunnea* Emerton and *A. elegans* in regard to characters of the palpus and epigynum is a sound index of their phylogenetic proximity.

Antistea brunnea (Emerton)

Figures 31, 32 and 33

Hahnia brunnea EMERTON, 1909, Trans. Connecticut Acad. Arts and Sci., XIV, pp. 223–224, Pl. VIII, Fig. 5. BANKS, 1910, p. 15. PETRUNKEVITCH, 1911, p. 534. CROSBY AND BISHOP, 1928, p. 1065.

A male from Maine measures 2.25 mm. and one from Alaska 2.20 mm. in total length. A female from Minnesota is 2.65 mm. long, the type from Massachusetts, 2.57 mm.

The integument of the carapace is light yellowish-brown and shows only faintly the radiating darker streaks present on the pars thoracica. The posterior median eyes are not ringed in black, but the others are in a black field, the clypeal region also somewhat darkened. The sternum and labium are slightly darker than the endites and coxae, these latter being a light grayish-brown and concolorous with the legs and palpi, which lack annulae or contrasting markings of any sort.

A third of the way back from the base of the abdomen above are the small orange spots, indicating the internal muscular attachments. The integument of the dorsum is light, and the slightly darker pattern of zigzag chevrons offer little contrast, the sides being darker. The venter is dark gray and the spinnerets are grayish brown.

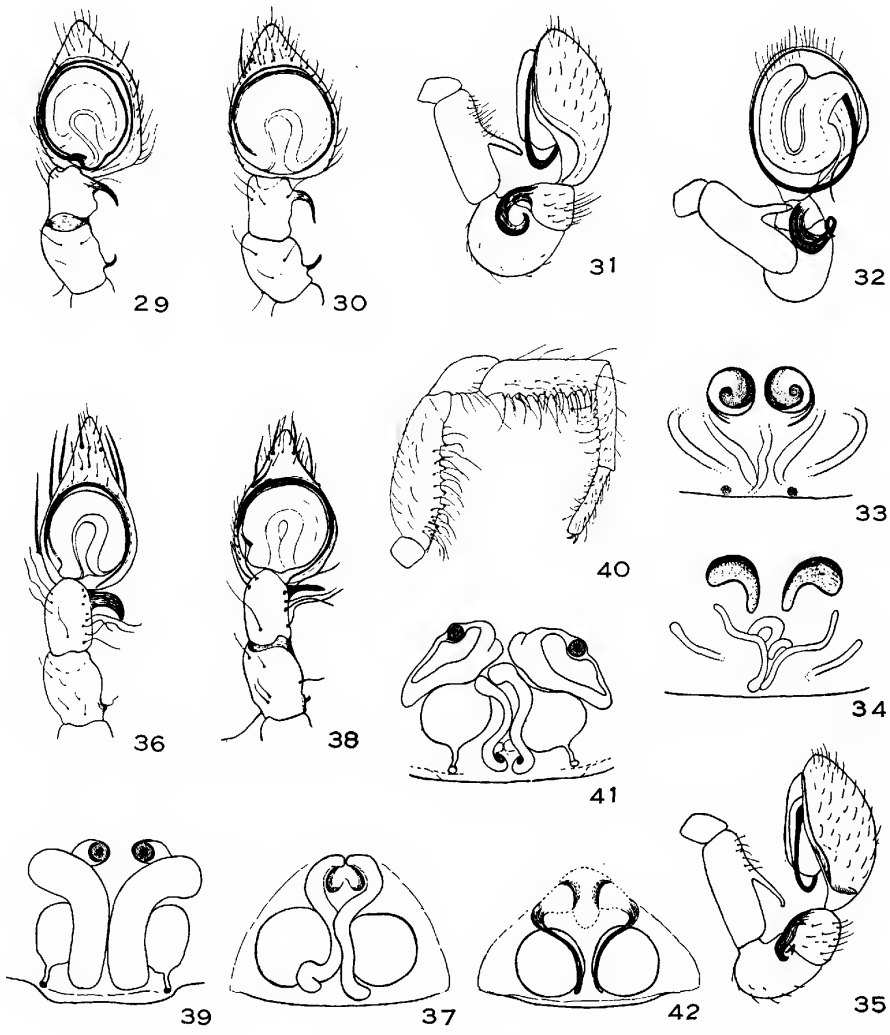
The male from Alaska was used as a basis for the following measurements.

	CARAPACE	FRONT	STERNUM	LABIUM	ENDITE	ABDOMEN
Length	1.05	.75	.60	.15	.25	1.30 mm.
Width	.92	.37	.70	.22	.25	1.07 mm.

Measurements of a female from Minneapolis, Minnesota.

	CARAPACE	FRONT	STERNUM	LABIUM	ENDITE	ABDOMEN
Length	1.05	.30	.60	.10	.25	1.75 mm.
Width	.90	.50	.70	.19	.25	1.27 mm.

The cephalothorax is smooth and shining and devoid of hairs and spines except on the margins of the clypeus. The rest of the specimens are rather evenly and



PALPI AND EPIGYNA

Fig. 29. *Neoantistea agilis* Keyserling.
Fig. 30. *Neoantistea gosiuta*, new species.
Figs. 31, 32, and 33. *Antistea brunnea* Emerton.
Figs. 34 and 35. *Antistea elegans* Blackwall.
Figs. 36 and 37. *Neoantistea barrowsi*, new species.
Figs. 38, 39, and 40. *Neoantistea riparia* Keyserling.
Fig. 41. *Neoantistea agilis* Keyserling.
Fig. 42. *Neoantistea gosiuta*, new species.

sparingly covered with black hairs. The carapace is somewhat longer than broad, truncate behind, broadly rounded on the sides to a point just behind the second eye row where a well-marked constriction delimits the cephalic portion, the front gently rounded. The width of the front is one-half the greatest width. The pars cephalica is highest just behind the area of the eyes, is moderately convex, the juncture between it and the less convex, nearly round thoracic portion fairly well marked. The median cephalic suture is located four-fifths of the length back. The clypeus is nearly vertical and equal in height to the diameter of an anterior lateral eye.

The first row of eyes is a little narrower than the second in the ratio 51: 55, is strongly procurved, the eyes being nearly equidistant. The second row of eyes is less procurved, the medians nearer the laterals than themselves in the ratio 5: 9. Ratio of the eyes: ALE: AME: PLE: PME = 16: 15: 12: 12. The eyes are not very dissimilar in size. The median quadrangle is about as long as broad (30/32), slightly narrower in front in the ratio 29: 32, the larger anteriors separated by one-fifth diameter, the posterior medians by three-fourths of a diameter. The anterior median eyes of the male are slightly larger than in the female.

The parallel chelicerae, which are twice as long as broad, have a number of strong, curved hairs at the distal end and have two unequal teeth on the upper margin. The lower margin of the right chelicera has the conventional three small subequal denticles, the left, however, with four, the additional one considered abnormal. The endites are provided with a band of hairs at the distal end on the inner side, and are over twice as long as the broader than long labium (.19 mm./.10 mm.). The sternum is broader than long, truncated behind, between the last coxae, which are separated by their width, squared off in front and at that point nearly equal to the greatest width. The lateral margins of the sternum and the distal end of the labium are armed with strong black hairs.

Leg formula, 4123. The first three pairs of legs are subequal, the last pair a little longer and more slender as indicated by the tibial indices.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	.75	.30	.57	.55	.42	2.59 mm.
II	.72	.30	.57	.55	.42	2.56 mm.
III	.70	.29	.54	.55	.44	2.52 mm.
IV	.84	.31	.77	.76	.57	3.25 mm.
Palp	.30	.15	.24		.40	.99 mm.

Ratio of coxae I: II: III: IV = 12: 12: 12: 13.

Width of patella I, .125 mm. Tibial index, 14.

Width of patella IV, .112 mm. Tibial index, 10.

The legs are sparsely clothed with short hairs and weak spines, those beneath the anterior femora more highly developed. The patella is provided at the distal end above with a spine, as in *agilis*, which seems to be a constant feature, but a dorsal basal or distal spine on the tibia and a prolateral or retrolateral one on the same joint may or may not be present.

The well-rounded abdomen is longer than broad. The spiracle is located nearly at a mid-point between the genital furrow and the base of the middle spinnerets in the female, slightly nearer the genital opening in the male (.25 mm./.37 mm.). The area of the spinnerets is about as wide as the width of the sternum. The lateral pair has the distal joint much shorter than the basal, in the ratio of .2 mm.: .1 mm. and is

longer than the second pair in which the distal joint is greatly reduced. The basal joints of the lateral, second, and middle spinnerets measure in millimeters .20, .17 and .14, respectively. In the male the distal joint of the lateral spinneret is half as long as the basal. The lateral spinnerets are placed slightly above the others, subcontiguous with the second pair, which are one-third their diameter from the subcontiguous medians.

EPIGYNUM.—The epigynal area is broader than long and scarcely two-thirds the breadth of the sternum. The conspicuous features are the paired atriobursal orifices, which are large and nearly contiguous, nearly round in outline. Traces of an intermediate narrow coiled tube can be seen through the sclerotic covering, apparently leading to the receptaculum seminis, which cannot be made out without dissection. *Antistea elegans*, the genotype, differs chiefly in the angular atriobursal orifices.

MALE PALPUS.—The remarkable similarity between the palpi of *A. elegans* and *brunnea* is a good index of their phylogenetic proximity. *A. propinqua* Simon, a second European species, differs only in the length of the femoral apophysis. The femur is about as long as the tibia and patella taken together and has a subventral spur that is about as long as the width of the joint. In *elegans* it is more slender and a little longer. The patella is considerably expanded in both species, the femoral articulation being at right angles to the joint. A small black spur at the distal end of the patella, present in *elegans*, is lacking in the American species. The small tibia has on the outer side a large sclerotized black apophysis which is more or less straight in *elegans* and greatly curved in *brunnea*. The cymbium is a little longer than broad, oval, the conspicuous feature being the embolic portion. It becomes free of the bulb near the distal end on the outer side, is somewhat supported from there to the base by a colorless conductor, curves around the periphery of the cymbium, and terminates in a groove on the retrolateral cymbial margin. The character of the groove is different in the two species, as shown in the figures.

DISTRIBUTION.—Maine: Island Falls, July 20, 1914 (Emerton). New Hampshire: Hanover (type locality of *brunnea*, Emerton, 1909). New York: Cinnamon Lake, June-July; Freeville, April-August; McLean, May; Little Pond, Orange Co., May (Crosby and Bishop, 1928); Ithaca (Emerton); Onondaga County (Britcher). Minnesota: Minneapolis, April 26, 1932 (Gertsch). Alaska: Ketchikan, August 29, 1922 (Marshall).

NEOANTISTEA, new genus

GENOTYPE.—*Neoantistea agilis* (Keyserling)

Carapace convex, about as broad as long. Eyes large, the anterior row procurved, straight from above, the medians slightly smaller, equal to, or larger than the laterals, equidistantly spaced. Posterior row of eyes slightly procurved, the medians farther apart, equal to or smaller than the laterals. Median ocular quadrangle as broad as long, the anterior eyes subequal or larger than the posterior medians. Lower margin of the furrow of the chelicerae with three subequal teeth in the females, a single large tooth in the males (except *agilis* and *gosiuta*). Sternum large, as broad as or broader than long. Labium broader than long. Spiracle twice as far from the

base of the median spinnerets as to the genital furrow. Spinnerets longer than in *Antistea*, the basal and distal joints of the lateral pair subequal.

As defined above, the genus *Neoantistea* is strictly Nearctic, no comparable forms being known from other regions. Four well-marked species are treated in this paper, and one, *N. radula* Emerton, is considered as an eastern race of the western *N. riparia* Keyserling.

KEY TO THE SPECIES OF *Neoantistea*

1.—Males.....2.
Females.....6.
2.—Lower cheliceral margin with three subequal teeth; patellar spur a strong spine more than half as long as the tibial apophysis.....3.
Lower cheliceral margin with a single large tooth; patellar spur greatly reduced 4.
3.—Tibial apophysis gently curved, directed laterad.....*N. agilis* (Keyserling).
Tibial apophysis strongly curved caudad.....*N. gosiuta*, new species.
4.—Tibial apophysis slender throughout its length.....5.
Tibial apophysis considerably expanded.....*N. barrowsi*, new species.
5.—Anterior median eyes not much larger than the posterior medians.
N. riparia race *radula* (Emerton).
Anterior median eyes considerably larger than the posterior medians.
N. riparia (Keyserling).
6.—Intermediate canal of epigynum much narrower than the width of the seminal receptacle.....7.
Intermediate canal of epigynum as broad as the width of the seminal receptacle..9.
7.—Intermediate canal not convoluted. Utah.....*N. gosiuta*, new species.
Intermediate canal convoluted. East and South.....8.
8.—Posterior median eyes about one diameter apart.....*N. agilis* (Keyserling).
Posterior median eyes one and one-half diameters apart.
N. barrowsi, new species.
9.—Anterior median eyes not much larger than the posterior medians.
N. riparia race *radula* (Emerton).
Anterior median eyes much larger than the posterior median eyes.
N. riparia (Keyserling).

Neoantistea agilis (Keyserling)

Figures 29 and 41

Hahnia agilis KEYSERLING, 1887, Verh. k. k. zool.-bot. Gesell., Wien, XXXVII, pp. 465–467, Pl. VI, fig. 29. MARX, 1890, p. 517. BANKS, 1895, p. 82. SLOSSON, 1898, p. 247. BRYANT, 1908, p. 78. BANKS, 1910, p. 15. BANKS, 1911, p. 443. PETRUNKEVITCH, 1911, p. 534. BARROWS, 1918, p. 301. BISHOP AND CROSBY, 1926, pp. 203–204. CROSBY AND BISHOP, 1928, p. 1065.

Hahnia bimaculata EMERTON, 1889, Trans. Connecticut Acad. Arts and Sci., VIII, p. 32, Pl. VII, figs. 8, 8*a*–8*f*. MARX, 1890, p. 517. BANKS, 1892, p. 27; 1893, p. 125. EMERTON, 1894, p. 412; EMERTON, 1902, p. 105. BANKS, 1916, p. 443.

The total lengths of four males from two localities are 2.37 mm., 2.42 mm., 2.25

mm., and 2.62 mm., an average of 2.41 mm. Five females measure 2.95 mm., 3.25 mm., 2.75 mm., 2.65 mm., and 3.00 mm., respectively, an average length of 2.92 mm.

The integument of the cephalothorax varies from light reddish-brown to dark chestnut, the pars cephalica appearing lighter. Black streaks radiate from the median cephalic suture, define the cephalic portion, and with an indistinct dark narrow marginal band make up the vague pattern of the carapace. The posterior median eyes are not ringed in black, all the others being in a black field. The sternum and labium are light to dark brown, the margins of the latter darker, the coxae and endites unmarked yellow. A conspicuous feature of the legs are the dark annulae, placed on the light yellow integument of each joint near the base and at the distal end, the only exception being the patella with a single ring and the lack of a distal one on the tarsus. These annulae are not completely obliterated in any specimen that I have seen so far, though in some cases they become faint or are broken above or below.

The pattern of the abdomen varies considerably in the depth of chromatism, the more or less constant features being five or six zigzag chevrons at the posterior half of the dorsum, through the middle of which is a longitudinal streak. The integument is gray, but the black markings often obscure any lighter color. About a third of the way back from the base are the two orange spots, the points of the muscle attachments beneath. The venter is much lighter, the constant color markings being a transverse black band across the region of the spiracle and a longitudinal dash of black from near the spiracle to the side spinnerets. The lateral and second spinnerets are black at the distal end.

A male from Bowling Green, Kentucky, measures 2.62 mm. and is used as the basis for the structural description and the measurements below.

	Carapace	Front	Sternum	Labium	Endite	Abdomen
Length	1.30	.35	.72	.17	.30	1.50 mm.
Width	1.12	.62	.77	.25	.27	1.20 mm.

The cephalothorax is smooth and shining and is almost devoid of hairs or spines of any sort, and these, when present, minute. The carapace is slightly longer than broad, truncated behind, the sides gently rounded to a point just behind the second eye row, where a weak constriction delimits the cephalic portion, the width at the weakly rounded front being nearly one-half the greatest width. The pars cephalica is moderately high, convex, and drops caudally rather gradually to the longitudinal furrow, which is located at a point four-fifths of the length of the carapace back. The sides of the pars thoracica are convex and blend into the head part without the intervention of well-defined sulci. The clypeus is almost vertical and equal in height to the diameter of an anterior lateral eye.

The first row of eyes is very slightly shorter than the second (142/150) and, although appearing straight from above, is strongly procurved, the line on the lower edge of the medians cutting a very small part of the upper edge of the laterals. The second row of eyes is less procurved. Ratio of the eyes: ALE: AME: PLE: PME = 15: 17: 13: 11. The eyes of the first row are about equidistantly spaced, the eyes larger than those of the second row and closer together, separated by about one-fourth of a diameter (4/17), the medians larger. The posterior median eyes are much nearer the laterals (6/16). The median ocular quadrangle is narrower in front (34/37) and broader than long in the ratio 37: 35, the anterior medians much larger.

The chelicerae are somewhat more than twice as long as broad, parallel, not much

wider at the base than distally, the upper margin with two unequal teeth above and a dentate sclerotized carina along the inner surface, the lower margin with three small subequal denticles. The broader than long labium is a little more than half as long as the endites, which are slightly convergent and provided with a band of hairs on the distal inner margin, the outer with two or three small tubercles from which short hairs project. The sternum is provided with a sparse covering of short black hairs and is slightly broader than long, widest at the second coxae, truncate in front and bluntly pointed caudally between the last coxae, separating them by their width.

Leg formula, 4123. The third pair of legs is three-fourths as long as the fourth, the longest pair, which is a little more slender than the others.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	.92	.40	.70	.62	.40	3.04 mm.
II	.85	.37	.62	.62	.40	2.86 mm.
III	.77	.36	.55	.62	.43	2.73 mm.
IV	.97	.37	.80	.87	.52	3.53 mm.
Palp	.50	.25	.16		.46	1.37 mm.

Ratio of coxae I: II: III: IV: = 18: 16: 14: 16.

Width of patella I, .150 mm. Tibial index, 13.

Width of patella IV, .125 mm. Tibial index, 10.

The spines on the legs of this species are poorly developed, and mention need be made only of the double row of bristles beneath the anterior femora which originate from slight tubercles, the almost invariable presence of a spine at the distal end of the patella above and an occasional one at the middle of the tibia beneath. The legs are clothed with rows of black hairs.

The abdomen is oval in outline as seen from above and not much longer than broad, well rounded at both ends, and projects slightly over the carapace in front. The spiracle is situated at a point much nearer the genital furrow than the spinnerets (3/7). The spinnerets are in a transverse line, about as wide at the base as the width of the sternum. The lateral pair, with equal basal and distal joints (.25 mm. each), is much longer than the second (basal joint .25 mm.) in which the distal joint is minute. The lateral pair is placed slightly above but nearly contiguous at the base with the second pair. The one-jointed median spinnerets (.175 mm.) are separated from each other by a diameter and are half as far from the second pair.

Male Palpus.—The femur is longer than the patella and tibia taken together and about equal in length to the tarsus. The patella is longer than the tibia and is provided near its base with a fine curved retrolateral spine that is directed forward and is much longer than the corresponding spine in *riparia*. The tibia is only two-thirds as long as the patella and has on the retrolateral distal margin a spur that is half the width of the joint and is directed obliquely outward. The cymbium is a little longer than broad and is shallowly hollowed to enclose the nearly circular bulbal apparatus. After encircling the margin of the bulb as a heavy tube, usually visible through the chitin, the seminal canal gradually diminishes in size, makes a prominent loop at an oblique angle on the retrolateral side and then joins with the embolic portion. The embolus, supported at the base by a colorless pars pendula, originates near the base of the cymbium, curves around the periphery of the bulb as a fine tube, terminating after completing nearly a full turn.

The following measurements are from a female from Onondaga County, New York, that is 2.95 mm. long.

	Carapace	Front	Sternum	Labium	Endite	Abdomen
Length	1.25	.30	.75	.17	.27	1.75 mm.
Width	1.05	.67	.77	.24	.25	1.32 mm.

The chelicerae are armed on the upper margin with three unequal teeth, the third in this specimen distinct from the inner marginal carina. On the lower margin are three small subequal teeth as in the male.

Ratio of the eyes: ALE: AME: PLE: PME = 17: 19: 12:12. The first row is slightly narrower than the second in the ratio 30: 32, strongly procurved, the eyes equidistantly spaced one-sixth of a diameter apart and not particularly dissimilar in size. Second row of eyes somewhat less procurved, subequal, the medians twice as far apart as their distance from the laterals (ratio 24: 13). The median ocular quadrangle is slightly narrower in front (35/37) and about as long as broad (38/37), the posterior medians one diameter apart, half as far from the anterior medians, which are larger (19/12). The posterior median eyes are subject to some variation in specimens from the same and from different localities. The clypeus is as high as an anterior lateral eye.

The legs are weakly spined as in the male and provided with the customary rows of black hairs. The formula is 4123 as in the male, the third pair being about three-fourths as long as the fourth.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	.85	.37	.60	.57	.42	2.81 mm.
II	.81	.37	.57	.57	.42	2.74 mm.
III	.75	.37	.50	.62	.42	2.66 mm.
IV	1.00	.37	.77	.85	.57	3.56 mm.
Palp	.42	.20	.25		.42	1.29 mm.

Ratio of the coxae I: II: III: IV = 17: 16: 14: 16.

Width of patella I, .150 mm. Tibial index, 15.

Width of patella IV, .125 mm. Tibial index, 11.

The abdomen is oval in outline and about three-fourths as broad as long, the ends well rounded. The spiracle is situated twice as far from the spinnerets as the genital furrow (.325 mm./.650 mm.). Although the transverse basal width of the area of the spinnerets is wider than the sternum, the spinnerets are arranged exactly as in the male, the proportions being about equivalent: basal and distal joints of lateral spinnerets equal (.30 mm.), basal joint of second pair, .25 mm., of middle pair, .20 mm.

Epigynum.—The female genital organ is composed of two more or less symmetrical units, two highly modified tubes, opening externally through the fertilization canals into the genital furrow and the paired atriobursal orifices. The structure, which is two-fifths as broad as the sternum, is covered by a thin sclerotic coat, through which the internal details are usually plainly visible. The atriobursal orifices are usually well separated, as shown in the figure, and open into a convoluted, expanded portion termed the bursa copulatrix. An intermediate narrow coil makes two loops between the receptacula seminis, another expanded portion from which the fertilization canals originate. The narrow intermediate coils are subject to much variation in position, and some of these variations have been figured by Emerton (Trans. Con-

necticut Acad. Arts and Sci., VIII, Pl. VII, figs. 8c-8f.). The proportions between these tubes and the breadth of the seminal receptacles are, however, constant.

DISTRIBUTION.—Maine: Isle-au-Haut (Bishop); Moosehead Lake, Bayville (Bryant, 1908). Vermont: Stowe (Bryant, 1908); South Newfane, June, 1926. New Hampshire: Franconia (Slosson, 1898); Jackson, Lake Winnepesaukee (Bryant, 1908); Mt. Washington (Emerton, 1889). Massachusetts: Salem, December 9, 1877 (type locality of *bimaculata*, Emerton, 1889); Ponkapoag Pond, August 25, 1926 (Emerton); Holliston, September 15, 1928; Gloucester, April 19, 1909 (Bryant); Monponsett, June 12, 1912 (Emerton); Ipswich, September 15, 1901 (Bryant); Newton, October 17, 1904 (Bryant); Topfield, October 29, 1926 (Bryant); Readville, June 25, 1904 (Bryant); Allston, April 21, 1906 (Bryant); Blue Hills (Barrows); Brookline, Sharon (Bryant, 1908). Connecticut: (cited by Emerton, 1889). New York: upper Cayuga Lake basin—Fall Creek, Cascadilla Creek, Six-mile Creek (Banks, 1892); Wilmington Notch, August; Lake Bluff, September; Otto, August; Olcott, September; Richbury, September; Rock City, September; Ithaca, May–June, August; Slaterville, August; McLean, April; Deruyter Lake, June; Dormansville, June; French Mills, Albany County, March; Vrooman's Nose, May; Juanita Island, July; Pine Island, May; Baiting Hollow, L. I., April (Crosby and Bishop, 1928); Bergen Beach, April 12, 1908 (von Krockow); Freeville; Sea Cliff (Banks); Alexandria Bay, Buck Island, June (Creighton); Long Island (Banks, 1895); Onondaga County (Britcher). New Jersey: Ramsey, December 1, 1921 (Emerton). Pennsylvania: (Petrunkevitch, 1911). D. C.: (Petrunkevitch, 1911). Virginia: Alexandria (Chamberlin); Falls Church (Banks). North Carolina: Roan Mt. Chapel Hill, Swannanoa Valley (Banks, 1911); Oteen, October 5, 1923; Mt. Pisgah, October 19, 1923; Walnut Creek, Raleigh, October 26, 1923; Bridgewater, October 14, 1923 (Bishop and Crosby, 1926). Kentucky: Bowling Green, September 3, 1928 (Barrows). Florida: Pensacola, January 1–8, 1925 (Barrows). Ohio: Columbus, November 10, 1917; Sugar Grove, December 16, 1915 (Barrows, 1918); Salineville (Banks). Kansas (Chamberlin). Illinois: Chicago (Banks). New Mexico: Las Vegas (Banks). Texas: Brazos County (Banks). Canada: Lake Winnipegosis (Emerton, 1894). Newfoundland: September, 1912.

Neoantistea gosiuta, new species

Figures 30 and 42

Hahnia radula CHAMBERLIN AND IVIE, 1933, Bull. Univ. of Utah, XXIII, p. 48. (Locality citation; nec *H. radula* Emerton.)

The total length of the male holotype is 2.60 mm., the female allotype, 3.30 mm., and three female paratypes 2.85 mm., 2.90 mm., and 3.25 mm., respectively.

The integument of the cephalothorax is dark, shining, reddish brown. The sternum and labium are concolorous with the carapace, but the endites, coxae, and legs are much lighter, dirty white to yellow. The legs of three of the females are unmarked, but the male and a single female have indistinct annulae on all the joints except the patellae and tarsi. The abdomen is marked as in *agilis*.

The male holotype is taken as a basis for the following measurements.

	CARAPACE	FRONT	STERNUM	LABIUM	ENDITE	ABDOMEN
Length	1.07	.27	.62	.15	.28	1.75 mm.
Width	.93	.56	.75	.25	.25	1.15 mm.

The smooth, shining cephalothorax is provided with several spines on the midline and a few on the clypeal margin. The carapace is slightly longer than broad as in the other species and has the pars cephalica distinctly higher but poorly differentiated from the thoracic portion, the sutures being slight and inconspicuous. The clypeus is equal in height to the diameter of an anterior lateral eye. On the lower margin of the furrow of the chelicerae are three small subequal denticles as in *N. agilis*. At the base of the claw on each side is a long feathery hair. The endites are modified, the distal outer margin being tuberculate, but this modification is in a much less degree than in *Neoantistea barrowsi, riparia,* and *radula*. The broader than long sternum and labium are clothed with a few hairs on the margins.

The first row of eyes is slightly shorter than the second (13/14), strongly procurved as seen from in front, and the eyes are about equidistantly spaced. Ratio of the eyes: ALE: AME: PLE: PME = 8: 6: 5: 5. The posterior median eyes are scarcely twice as far apart as their distance from the laterals (7/4). The median ocular quadrangle is narrower in front (78/83) and about as broad as long (83/88), the anterior medians much larger.

Leg formula, 4123. The legs are armed with the customary bristles as in the other species.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	.90	.40	.67	.65	.42	3.04 mm.
II	.82	.37	.65	.65	.42	2.91 mm.
III	.75	.30	.57	.65	.40	2.67 mm.
IV	1.00	.32	.77	.90	.52	3.51 mm.
Palp	.45	.25	.17		.42	1.29 mm.

Width of patella I, .162 mm. Tibial index, 15.

Width of patella IV, .137 mm. Tibial index, 12.

The spiracle is situated much nearer the genital furrow than the spinnerets (1/2). The spinnerets are placed as in *agilis*, the distal joint of the laterals equal in length to the basal joint.

MALE PALPUS.—This species is closely related to *N. agilis* in male genital characters. The bulb is subovate, and the loop of the seminal duct runs about parallel to

the long axis of the joint. The patellar spur is a short spine about half as long as the tibial apophysis, which is curved sharply caudad. In lateral view this species has considerable resemblance to Keyserling's figure of *riparia*, which was described from Utah. The patellar spur, however, is a spine, not a small tubercle, a character of considerable import in this genus, and unless another closely related form is involved, it seems certain that *N. riparia* (Keyserling) has been correctly identified. The species also differ considerably in size.

The following measurements are for the female allotype.

	Carapace	Front	Sternum	Labium	Endite	Abdomen
Length	1.37	.32	.75	.20	.35	2.10 mm.
Width	1.20	.70	. 87	.27	.30	1.65 mm.

The female agrees well with the male in all important characteristics. The lower margin of the furrow of the chelicerae of the allotype has only two teeth, but in the paratypes three are present. The spiracle is twice as far from the base of the median spinnerets as to the genital furrow (1/2.6). The epigynum is near the conventional type, the openings being close together and the intermediate canal a slender black tube.

Type Locality.—Male holotype from east of Yost, Utah, September 6, 1932, "from under rocks" (Ivie), female allotype and paratypes from the South Fork of the Raft River, eight miles south of Lynn, Utah, taken on the same date by Mr. Ivie. The types are in the collection of the University of Utah, the paratypes in the collection of The American Museum of Natural History.

Neoantistea riparia (Keyserling)

Figures 13, 14, 15, 16, 17, 38, 39 and 40

Hahnia riparia Keyserling, 1887, Verh. k. k. zool.-bot., Gesell., Wien, XXXVII, pp. 463–464, Pl. vi, fig. 27. Marx, 1890, p. 517. Banks, 1910, p. 15.

Hahnia magna Keyserling, 1887, Verh. k. k. zool.-bot., Gesell., Wien, XXXVII, pp. 464–465, Pl. vi, fig. 28. Marx, 1890, p. 517. Banks, 1910, p. 15. Petrunkevitch, 1911, p. 534. Worley and Pickwell, 1927, p. 67. Worley, 1932, p. 52.

Antistea riparia Simon, 1898, 'Histoire Naturelle des Araignees,' II, p. 529.

A male from Montpelier, Idaho, measures 4.00 mm. in total length, but two females from the same collection are smaller, 3.66 mm. and 3.50 mm., respectively. A female from Seba, Alberta, measures 4.12 mm.

The integument of the carapace is light brown in the few specimens at hand, the cephalic and thoracic striae well marked in black, the margin with a narrow black line. All eyes except the posterior medians are in a dark field. The sternum and endites are light to dark brown, darker than the coxae. In the male the first leg is not marked, but the others show definite traces of black annulae at the base and near the distal ends of all joints but the patellae and coxae, which have a single ring. In the female all the legs are distinctly annulate. The pattern of the abdomen is the same as in *Neoantistea agilis* (Keyserling).

The structural measurements of the male are as follows.

	Carapace	Front	Sternum	Labium	Endite	Abdomen
Length	1.75	.37	1.00	.30	.55	2.62 mm.
Width	1.61	.97	1.22	.38	.50	2.00 mm.

The smooth, shining cephalothorax is provided with a few stout hairs on the clypeus, in the eye area and on the midline near the median suture above. The somewhat longer than broad carapace has the sides broadly rounded, is truncated behind, and has the truncate cephalic portion delimited from the thoracic by a very weak constriction. The pars cephalica is about half as broad as the greatest width of the carapace, is highest just behind the eye group, strongly convex and considerably higher than the slightly convex pars thoracica. The well-marked median suture begins two-thirds of the distance back. The clypeus is vertical, equal in height to the diameter of an anterior lateral eye.

The first row of eyes is slightly narrower than the second in the ratio 83: 86, strongly procurved, the eyes nearly equidistantly spaced. The second row is less procurved and has the medians farther apart than their distance from the laterals (20/13). Ratio of the eyes: ALE: AME: PLE: PME = 20: 23: 19: 16. The median ocular quadrangle is slightly longer than broad (53/50), is narrower in front (44/50), the anterior median eyes much larger. The posterior median eyes are separated from the anterior medians by scarcely a diameter of the former.

The chelicerae are twice as long as broad, subparallel, and are armed on the upper margin with two unequal teeth, followed by a dentate carina on the inner side, the lower margin with a single large tooth. The slightly broader than long labium is a little more than half as long as the endites, which are coarsely granulate throughout, provided with a band of hairs at the distal inner side and three or four stout tubercles on the distal outer side. These characteristic tubercles and the smaller granules are the bases from which project stout hairs. The sternum is decidedly broader than long, clothed sparsely with hairs that are longest on the margins, is broadest at the second coxae, and weakly truncate between the last coxae, separating them by nearly their length.

Leg formula, 4213. The second pair of legs in the only male specimen in our collection is slightly longer than the first.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	1.65	.85	1.30	1.20	.70	5.70 mm.
II	1.67	.85	1.30	1.20	.75	5.77 mm.
III	1.30	.57	1.00	1.15	.70	4.72 mm.
IV	1.75	.62	1.30	1.40	.80	5.87 mm.
Palp	.75	.37	.25		.70	2.07 mm.

Ratio of coxae I: II: III: IV = 32: 31: 23: 23.

Width of patella I, .275 mm. Tibial index, 12.

Width of patella IV, .200 mm. Tibial index, 10.

The femora of the first two pairs of legs are strongly incrassate at the base above. Beneath all the joints of these two pairs are two rows of strong tubercles and smaller scattered granules from which originate strong, recurved, spiny hairs. The other pairs are well clothed with hairs and very weak spines.

The abdomen is three-fourths as broad as long, oval, well rounded in front and

behind. The spiracle is much nearer the genital furrow than the spinnerets, the measurements being .40 mm. and 1.07 mm. The spinnerets are arranged as in *agilis*. The terminal joint of the lateral spinnerets is slightly longer than the basal (.45 mm./ .43 mm.) The basal joints of the second and median pairs measure .37 mm. and .30 mm., respectively, the distal joint lacking in the median and greatly reduced in the second pair.

Male Palpus.—The differences between this palpus and that of *agilis* are not considerable. The femur is about as long as the tarsus, and either of these a little longer than the patella and tibia taken together. The spur on the patella is greatly reduced. The tibia is proportionately slightly longer than in *agilis* and has an outer spur that is directed nearly at a right angle from the joint. The cymbium is longer than broad, shallowly hollowed out, enclosing the circular bulbal apparatus. The seminal tube is quite broad, and the loop is parallel to the long axis of the joint, not oblique as in *agilis*. The circular embolus, which originates on the prolateral side near the base, circles the bulb and comes to rest on the cymbium near the outer tibial spur.

Female.—A specimen from Montpelier, Idaho, measures 3.66 mm. and serves as the basis for the following measurements.

	Carapace	Front	Sternum	Labium	Endite	Abdomen
Length	1.45	.32	.80	.21	.30	2.25 mm.
Width	1.22	.75	.90	.30	.30	1.70 mm.

The female is in full agreement with the male in significant structural features. The lower margin of the furrow of the chelicera is armed with three subequal teeth, the upper with two unequal teeth.

The eyes of the first row are slightly narrower than the second in the ratio 71: 74, strongly procurved, equidistantly spaced about one-fourth of a diameter apart. The second row of eyes is less procurved, the medians farther apart than their distance from the laterals (16/11). Ratio of the eyes: ALE: AME: PLE: PME = 18: 17: 13: 13. The median ocular quadrangle is as long as wide, very slightly narrowed in front (38/40), the anteriors considerably larger. The clypeus is as high as the diameter of an anterior lateral eye.

Leg formula, 4123. The legs are weakly spined, the first two pairs slightly incrassate basally.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	1.00	.47	.82	.78	.52	3.59 mm.
II	1.00	.47	.78	.78	.55	3.58 mm.
III	.92	.42	.70	.80	.55	3.39 mm.
IV	1.15	.45	1.00	1.07	.65	4.32 mm.
Palp	.46	.22	.32		.52	1.52 mm.

Ratio to coxae I: II: III: IV = 19: 19: 17: 18.

Width of patella I, .162 mm. Tibial index, 12.

Width of patella IV, .137 mm. Tibial index, 10.

The spiracle is situated much nearer the genital opening than the spinnerets, the measurements being .35 mm. and 62 mm. The basal joints of the lateral, second and median spinnerets are .30 mm., .26 mm., and .22 mm., respectively, the distal joint of the lateral one longer than the basal, .35 mm., the distal joint of the second spinneret very short.

EPIGYNUM.—The genital structure of the female is four-sevenths as wide as the sternum and about as long as broad. The thin sclerotic covering is transparent and the epigynal units are clearly visible. The atriobursal orifices are separated by about their diameter and open into a much expanded bursa copulatrix. The intermediate canals are much larger than in *agilis* and are not greatly coiled, joining the expanded receptacula after one turn. Small fertilization canals conduct the semen to the genital furrow and are visible as small dark tubes. The ventral aspect of the epigynum shows the two oval receptacula, and between them the two intermediate canals, which are about as broad as the receptacula.

DISTRIBUTION.—Utah: Spring Lake (type locality of *riparia*, Keyserling, 1887). Wyoming: Fort Bridger (type locality of *magna*, Keyserling, 1887). Idaho: Montpelier, August 16, 1931; Nounan, August, 1931 (Gertsch). Washington: Pullman, Olympia (Banks collection); Palouse, August 28, 1932 (Hatch); Spokane, August 25, 1928 (Hatch). California: Claremont (Banks collection). Canada: Alberta-Seba, June 3–July 6.

Neoantistea riparia race **radula** (Emerton)

Figure 18

Hahnia radula EMERTON, 1889, Trans. Connecticut Acad. Arts and Sci., VII, p. 32, Pl. VII, figs. 10 and 19*a*. MARX, 1890, p. 517. BANKS, 1892, p. 27. BRYANT, 1908, p. 78. BANKS, 1910, p. 15. PETRUNKEVITCH, 1911, p. 529.

Two males from Tennessee measure 2.70 mm. and 3.25 mm., and three females from the same locality are 3.00 mm., 2.60 mm., and 2.75 mm. in total length. A female from Urbana, Illinois, is 3.75 mm. long.

There seems little doubt as to the conspecificity of eastern specimens with Great Basin material, and yet the constant differences in the eye-group relations would seem sufficient to warrant the retention of Emerton's name as a racial category. Generally speaking, a variation in size is interesting but of no great importance. On the basis of the sparse western material at hand it appears that the average size is greater, but such differences may be matched from other localities. In the genitalia, structure of the legs, shape of the sternum, the position of the spiracle, and in most characters there is complete agreement in specimens from both regions. While it is true that the eyes are extremely variable, such differences occur within definite limits.

Ratio of the eyes of a male from Tennessee: ALE: AME: PLE: PME = 18: 16: 18: 18. The median quadrangle is broader than long (44/40) and narrower in front (37/44), the anterior medians slightly smaller in size. Eyes of the second row equal in size, the medians farther apart than their distance from the laterals (11/7). Ratio of eyes of a female from Tennessee: ALE: AME: PLE: PME = 19: 16: 16: 17. Median quadrangle as broad as long, narrower in front (22/32), the anterior median eyes slightly smaller. Specimens of *radula* from New England have the eyes of the median quadrangle subequal.

DISTRIBUTION.—Maine: Bayville (Bryant, 1908). New Hampshire: Jaffrey, August 1 (type locality of *radula*, Emerton, 1889); Randolph, July, 1926 (Emerton and Banks); Moosilauke, July 8, 1912. Massa

chusetts: Blue Hills (Barrows); Mt. Greylock (Miner); Tyngsboro, July, 1909 (Emerton); Brookline, October 17, 1904 (Bryant); Gloucester, November 3, 1908; Clarendon Hills, November 3, 1904 (Bryant). New York: upper Cayuga Lake basin (Banks, 1892); Ithaca (Banks); Penn Yan; Cold Spring Harbor, Long Island, April 8, 1905 (Bryant). New Jersey: Ramsey, June 12, 1912 (Emerton). Virginia: Smugglers Notch Mt., Mansfield, July 10, 1908. North Carolina: Newfoundland Gap, August 30, 1930 (Banks). Tennessee: sides of Mount Leconte, September 9, 1928 (Barrows); idem, July 12, 1933 (Gertsch and Ivie). Illinois: Urbana. Michigan: Isle Royale (hermaphrodite). Canada: southern Labrador, July, 1915 (C. W. Townsend); Lake Winnipegosis, 1888 (D. B. Dowling); Kapuskasing, Ontario, June (P. A. Javerner); Moose River Islands, James Bay, June 28, 1920, latitude 51°.

Neoantistea barrowsi, new species

Figures 36 and 37

A male from North Carolina measures 4.25 mm. in total length; a female from Kentucky is slightly smaller, 3.65 mm.

The color pattern of this species is in complete agreement with that of *riparia* and *agilis*. The male has the carapace nearly black, devoid of hairs or spines as in the other species. The carapace of the female is light brown. The legs of both sexes are indistinctly annulate in black, and the side spinnerets have a conspicuous ring at the distal end of the basal joint. The measurements of the male follow.

	Carapace	Front	Sternum	Labium	Endite	Abdomen
Length	2.10	.45	1.25	.30	.62	2.42 mm.
Width	1.95	1.00	1.50	.42	.62	1.90 mm.

The clypeus is provided with long spines. The slightly longer than broad carapace has the thoracic part nearly round, the broad cephalic portion considerably higher and slightly rounded in front and marked off from the pars thoracica by a very weak suture. The well-marked median suture begins two-thirds of the distance back from the front margin. The nearly vertical clypeus is equal in height to the diameter of an anterior lateral eye.

The first row of eyes is slightly narrower than the second in the ratio 12: 13, strongly procurved, equidistantly spaced. The second row is less procurved and has the medians farther apart than their distance from the laterals (3/2). Ratio of the eyes: ALE: AME: PLE: PME = 22: 28: 18: 17. The median ocular quadrangle is broader than long (6/5.7), slightly narrower in front in the same ratio. The posterior median eyes are separated from the anterior medians by a diameter of the former.

The chelicerae are armed on the lower margin with a single large tooth, the upper with three of which the median is much larger. The sternum, labium, and endites are as in *N. riparia*, the latter with the armature of tubercles and granules even more highly developed than in that species. The legs agree well in stoutness and spining with those of *riparia*. Leg formula, 2143.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	2.25	1.00	1.80	1.70	.95	7.70 mm.
II	2.32	1.00	1.92	1.87	1.00	8.11 mm.
III	1.74	.67	1.32	1.50	.87	6.10 mm.
IV	2.75	.67	1.70	1.92	1.10	7.64 mm.
Palp	.92	.42	.32		.75	2.41 mm.

Ratio of coxae I: II: III: IV = 38: 38: 25: 28.

Width of patella I, .42 mm. Tibial index, 15.

Width of patella IV, .20 mm. Tibial index, 8.

The oval abdomen is three-fourths as long as broad. The spiracle is located much nearer the genital furrow than the spinnerets, the measurements being .375 mm. and .92 mm., respectively. The spinnerets are arranged as in *agilis*, but the lateral one (basal joint .75 mm., distal joint .69 mm. long) is much more robust than the second one, the basal joint of which is .50 mm. long. The middle spinneret (.42 mm. long) is decidedly shorter than the basal joint of the lateral pair.

Male Palpus.—The femur, which is provided with a strong tuberculate carina on the lower side, is longer than the tarsus or the patella and tibia taken together. The patella is twice as long as broad and has a small spur at the base on the retrolateral side. The tibia is longer than broad and is armed at the distal retrolateral margin with a bladelike, black apophysis, decidedly broader than in *riparia* or *agilis*. In other particulars, except the tibial apophysis, the species closely approximates *N. riparia* (Keyserling).

The following measurements are for the female.

	Carapace	Front	Sternum	Labium	Endite	Abdomen
Length	1.75	.42	1.02	.22	.45	2.15 mm.
Width	1.65	.90	1.15	.32	.45	1.75 mm.

Ratio of the eyes: ALE: AME: PLE: PME = 18: 25: 16: 15. The median ocular quadrangle is as broad as long, the posterior median eyes separated from each other by more than a diameter (15/22), about a diameter from the posterior laterals and the anterior medians. The lower margin of the cheliceral furrow is armed with three subequal teeth, the upper with three, of which the middle one is larger. The spinnerets in both sexes of this species are very long, the lateral one slightly longer than the length of the sternum, and its distal joint slightly longer than the basal (.57 mm./.50 mm.). The second spinneret has the basal joint somewhat shorter (.42 mm.) but longer than the middle spinneret (.36 mm.).

Leg formula, 4123.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	1.40	.60	1.10	1.05	.70	4.85 mm.
II	1.40	.52	1.07	1.05	.70	4.74 mm.
III	1.20	.50	.95	.95	.67	4.27 mm.
IV	1.50	.55	1.32	.142	.87	5.66 mm.
Palp	.67	.25	.40		.67	1.99 mm.

Width of patella I, .20 mm. Tibial index, 11.

Width of patella IV, .16 mm. Tibial index, 8.

Type Locality.—Male holotype from Franklinton, North Carolina, August 21, 1933, taken by Mr. Wilton Ivie "in a field under a small

board," the specimen deposited in the collection of the University of Utah. Female allotype from Bowling Green, Kentucky, September 3, 1927, kindly given to the American Museum by Dr. William M. Barrows, of Ohio State University, who collected the species.

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